

Best Practices in Instructional Scaffolding



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Best Practices in Instructional Scaffolding



The word scaffolding might remind you of construction, referring to the supports that assist workers to reach higher in order to build a complete structure. In education, it refers to various instructional techniques that help you move your students forward to stronger understanding of what they are learning, and to a greater independence in their own learning processes and development. Much like a construction scaffold supports a construction worker while they build, educational scaffolds, or supports, can be added, modified, and removed according to the needs of the group that an educator is working with (Sawyer, 2006). Scaffolding supports students in the mastery of various tasks working towards learning goals and outcomes, and can make the student more independent in the learning process.

This theory is grounded in the work of Lev Vygotsky, a psychologist and educator who coined the term “zone of proximal development,” an abstract mental region where what students already know intersects with what they do not yet know. Vygotsky argued that learning is most effective when the learning process calls students to this zone (University of Waterloo, n.d.). He theorized that when students are given a task that is just out of the reach of their competence, but are able to secure the support of others, it is likely that they will accomplish the task in a more successful fashion than if left alone to struggle with it. With scaffolding, the educator is able to break down tasks within this reach, as well as offer guidance on how tasks can be completed. By being able to participate in a concrete learning process, students can more easily complete tasks that seem abstract or confusing when first introduced (Sawyer, 2006).

In this issue of *Best Practices*, we will review two methods for developing assignments that have been shown to improve student learning:

1. Process scaffolding, and
2. Critical thinking scaffolding.



Process Scaffolding

Process scaffolding breaks a complex task down into smaller, more manageable parts that slowly increase in cognitive complexity in order to form a cohesive whole (University of Waterloo, n.d.; Schroeder, 2012). By breaking down major assignments into several components, you can focus on the skills or types of knowledge students require to successfully complete the larger assignment, and support them in a way where student engagement is increased, rather than assigning a single assignment that might be initially confusing and overwhelming (Writing Center, University of Colorado, n.d.).

Sequencing these assignments is crucial: you must order them in such a way that students master a skill set that is important to develop the next. The process allows students to see the bigger picture, and allows you to empower students to work towards it independently.

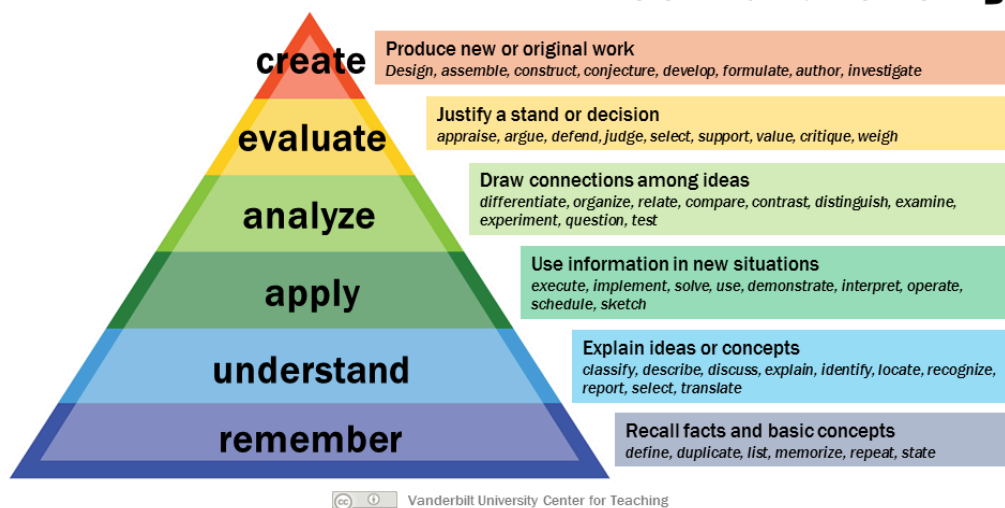
Benefits of Process Scaffolding

There are numerous benefits of process scaffolding for both students and faculty.

Student Benefits

- Makes the process of developing what might otherwise seem like a complicated assignment seem much more feasible.
- Assignments that could appear unmanageable are presented as a set of understandable tasks.
- Gives students a chance to gain expertise with a set of academic skills in a graduated way.
- Helps students to develop transferable skills that can be used throughout their entire academic career.

Bloom's Taxonomy



[Fig. 1: "Bloom's Taxonomy." Vanderbilt University. CC BY 2.0](#)

Faculty Benefits

- Makes the learning process more transparent, and sets a clear path to achieving learning outcomes.
- Presents assignments as integrated activities aligning with course goals, in a logical sequence.
- Allows for intervention at important junctures in order to provide feedback and keep students on track.
- Helps students develop Higher Order Thinking Skills (HOTS), and empowers them to see connections between tasks. Higher Order Thinking Skills are ones that help students

meet learning outcomes at the analysis, evaluation, and creation levels of Bloom's Taxonomy (Fig. 1). These are the skills that students most need to be "competent in their future [professions] and to deal with the complexities in real life situations" (University of North Texas, 2015).

Learning Strategies Using Process Scaffolding

Many complex assignments, such as research papers and lab reports, can be broken down into concrete components. Here is an example that shows how an assignment to write a research paper can be broken down into numerous steps:

| Steps in developing a research paper | Smaller assignments within each step |
|--------------------------------------|---|
| Topic Selection | <ul style="list-style-type: none"> Identifying a problem, issue, area of interest, and developing a research question Mind mapping/brainstorming Proposal Development of thesis statement |
| Research | <ul style="list-style-type: none"> Library session demonstrating where and how to find the best resources Annotated bibliography Concept map |
| Evaluation of Sources | <ul style="list-style-type: none"> Literature review List of supporting/refuting evidence (Critical Review) |
| Draft | <ul style="list-style-type: none"> Outline First draft |

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|----------|--|
| Revision | <ul style="list-style-type: none"> • Peer revision • Formatting • Bibliographic formatting • Meta-statement (reflection on points for improvement) |
|----------|--|

Adapted from Fedko and Skene's "Assignment Scaffolding," University of Toronto Scarborough, and Nowak's "Scaffolding Research Assignments," Columbia College, Vancouver, B.C.

For additional ideas on how to break down a major assignment into smaller concrete tasks, please see pages 17 to 55 in Schroeder's "Scaffolded Assignments: Designing Structure and Support," in which the author has collected numerous examples of scaffolding for various assignment types and subject areas.

Sequencing a Process Scaffolded Assignment

In order to effectively break down a process scaffolded assignment, you must first identify the knowledge and skills needed in order to complete the assignment, and create a path for students to follow in the form of several shorter assignments that are both easier to complete and understand (Caruna, 2012). According to Caruna, this is typically broken down into four steps:

1. Establish a final assignment, including the skills that you want to evaluate. Make sure that the assignment has clear learning objectives.
2. Determine the prerequisite skills students will need to have to be successful on the assignment, and list them. Think about whether these prerequisite skills are reasonable for students to have. If they are not, then you will want to scaffold these into your course work.
3. Identify the needed skills sequence.
4. Create an assignment sequence that focuses on individual skills so that students build the predetermined prerequisite skills needed to complete the final assignment.

According to Fedko and Skene (2012), scaffolding works best when the instructor is transparent with students about the process. Be clear about the purposes of the assignment, and what you want students to learn, as this will help them transfer these skills in deliberate ways throughout their academic career. Also, communicate expectations and include grading rubrics, as this will also assist students in ensuring that they are including all components.



Critical Thinking Scaffolding

In their article “Scaffolding: A Promising Approach to Fostering Critical Thinking,” Browne et. al. (2009) state that teaching students how to think, versus what to think, is the end goal of education. The authors define critical thinking as “reflective and reasonable thinking that is focused on deciding what to believe,” (p. 115). Essentially, teaching students critical thinking skills is essential for them to be successful in their fields.

According to Fedko and Skene, there are specific scaffolding techniques that you can use to help students develop critical thinking skills. As with Process Scaffolding, Critical Thinking Scaffolding assigns work in a way that allow students to move gradually from lower order critical thinking skills towards more complex, higher order critical thinking skills. Lower order level assignments may consist of abstracts, summaries, or descriptions, in order to reinforce skills such as remembering and understanding concepts. Higher level skills such as applying, analyzing, evaluating, and creating, can be reinforced through assignments such as case study analysis, mind-mapping, developing a business plan, research paper, or lab report.

According to Browne et al., there are four steps to proper critical scaffolding. These are:

1. Shared understanding of the scaffold between instructor and student.
2. Expert modeling of skills.
3. Continuous feedback and assessment.
4. Deconstruction of the scaffold.

An example of critical thinking scaffolding is Browne’s integration of case studies into her syllabi. Case studies are a great pedagogical tool because they ask students to interpret, analyze, and apply information (p. 115), all higher order thinking skills. Brown integrated “case analysis assignments” that asked students to carry out various tasks, providing a rubric that explained the purposes and expectations of scaffolding. Expert modelling was first demonstrated by the instructor, then peer to peer, as students were asked to name stakeholders, state a recommendation, and identify evidence to support it. Students continually received feedback through the expert modeling as well as from the instructor, and each case result was an indicator of how the student was progressing in terms of critical thinking, week to week. Deconstruction of the scaffold occurred over time, as expert modelling and prompts were reduced (p. 116). This process ideally develops new critical and cognitive skills in students.

It might be challenging to implement scaffolded critical thinking skills in large classrooms, as there is extensive marking involved. The chart below, adapted from Fedko and Skene’s Assignment Scaffolding offers very useful and practical suggestions.

| Learning Objective | Ideas for Large Classes | Advantages | Critical Thinking Skills |
|--|---|---|--|
| Remember a term or definition | <ul style="list-style-type: none"> • iClickers • Multiple choice or self-test quiz | <ul style="list-style-type: none"> • Quick • Immediate • Can break up lecture | <ul style="list-style-type: none"> • Remembering • Understanding |
| Improve comprehension of a complex concept | <ul style="list-style-type: none"> • One minute papers • Reflection paper • Statement of confusion | <ul style="list-style-type: none"> • Can be done in class • Can be done at home • Gives an instructor an idea of student understanding | <ul style="list-style-type: none"> • Understanding |
| Synthesizing essential course concepts | <ul style="list-style-type: none"> • Journaling • Blogging | <ul style="list-style-type: none"> • No feedback needed - can be pass/fail • Can be systematic and completed throughout the term | <ul style="list-style-type: none"> • Understanding • Creating |

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| Develop more sophisticated research and writing assignments | <ul style="list-style-type: none"> • Peer-reviewing • Meta-statements • Debating | <ul style="list-style-type: none"> • Helps students to identify gaps and see what is needed, with the onus on the student • Active and engaging in class activity where students can partner in pairs | <ul style="list-style-type: none"> • Creating • Analyzing • Applying |
| Ability to analyze and apply previous knowledge | <ul style="list-style-type: none"> • Case studies • Read-mapping • Constructing and experiment or a hypothesis | <ul style="list-style-type: none"> • Helps students apply what they have learned to real world examples. • Helps them to connect concepts. | <ul style="list-style-type: none"> • Applying • Analyzing • Evaluating |

* See “Assignments Defined” in the following section for descriptions of many of these techniques. For additional information about how to incorporate active learning techniques into the classroom, please see our *Best Practices* on “Active Learning.”

Assignments Defined



Adapted from Fedko and Skene’s “Assignment Scaffolding,” University of Toronto Scarborough.

- **iClicker questions:** Basically, an in-class multiple choice question. If you do not use iClickers, you can have students answer using software on their phones or computers (PollEverywhere, TopHat, Socrativ), or you can even ask students to raise their hands per option. This gives back immediate feedback to the student, and also gives you a sense of the students’ comprehension level.
- **Self-test quiz:** Use D2L or Google Forms to create a quiz that asks students a series of questions. Have the students complete it and go over the answers in class. Traditionally, this was a time consuming task. However, with the above mentioned tech products, it is

far more simple. They can even be automated to provide students with immediate feedback.

- **One-minute paper:** Very brief paper that is written in class, and does not allow for any planning or revision, written on a clear question given by the instructor. Can help with writing skills and can test what the student already knows, and how accurately.
- **Reflection paper:** A very short writing assignment that allows students to process and think about the material, what they understand, what they are confused about, and any patterns that they might notice. Again, it is important to give students a clear prompt.
- **Statement of confusion:** Students write one to two paragraphs about what they may still be confused about. Can also be useful in identifying whether many students are getting confused about the same topics.
- **Journaling:** Students reflect on their learning process throughout the term in the form of journal entries. Entries should be given clear prompts, and should be related to course material or learning objectives.
- **Blogging:** Asking students to reflect on course content or reading on a regular basis, so that they regularly reflect on what they are learning. Similar to journaling but allows for broader sharing, although blog entries can also be kept private. Clear prompts are also helpful here, as in journaling.
- **Peer-reviewing:** Students learning how to evaluate arguments and give good feedback. The provision of a rubric to guide this activity is typically very effective.
- **Meta-statements:** During the review process for an assignment, students write a paragraph indicating how they would improve their work from a content perspective. This will help them with analysis skills, and can be helpful even after the paper has been graded and handed in.
- **Debating:** This is a formal/semi-formal discussion of a particular topic in which opposing arguments are presented. Students can be divided into large teams presenting broad sides, or can be paired up in order to present arguments. You can have students prepare position papers ahead of time, or give them time in class to do this. This activity will help students see various positions of a topic, and will make learning active.
- **Case studies:** These are scenarios that ask students to interpret, analyze, and apply information. You can use these so that students hone their critical thinking skills, applying evidence to a real life event.
- **Read Maps:** This is a map that helps students synthesize their research and course readings, in hopes of linking concepts together.



Troubleshooting Scaffolding

| Concern | Response |
|---|---|
| "Scaffolding takes too much time." | <ul style="list-style-type: none"> • It takes time in design, but it will save time and reduce frustration when grading, particularly large final assignments. • Use technology: Contact the Digital Media Projects Office for tools that can support scaffolding. • Build learning communities in the class so peers can offer one another feedback. |
| "Students complain it's too much work." | <ul style="list-style-type: none"> • Be explicit about process and value of working step by step towards goals; explain that it isn't really more work, just organized differently. • Students report that scaffolding reduces stress. • Emphasize connections to course learning objectives. |
| "It adds too much to my marking load." | <ul style="list-style-type: none"> • Not everything has to be marked or marked individually. Give group feedback where possible. • Give pass/fail grades for less consequential assignments. • Stagger assignments. • Give early feedback. • Have students review their peers' papers. • Focus feedback on learning objectives. • Develop grading rubrics to facilitate marking. |

| | |
|---|---|
| <p>“I tried grading and giving feedback on early drafts and students just made the specific changes I suggested and expected better marks.”</p> | <ul style="list-style-type: none"> • Give pass/fail grades for early drafts—or take off grades if students don’t submit a draft. • Include global recommendations for improvements as well as specific ones. • Make clear criteria for actually getting a better mark (i.e. a revision rubric). • Define revision and discuss process and expectations explicitly— show examples of drafts of your own writing. • Make final step worth the bulk of the marks. |
| <p>“I like the idea of peer review but I’m afraid that students won’t take it seriously.”</p> | <ul style="list-style-type: none"> • Do it in class and introduce by discussing the professional peer review process. • Ask student reviewers to answer specific questions on a handout (broad questions around thesis, argument, and organization tend to be better than grammar) and give you a copy of this feedback. You can then mark the feedback (pass/fail can make this step less of a burden). |
| <p>“Scaffolding makes it too easy and will alienate the brighter students.”</p> | <ul style="list-style-type: none"> • Scaffolding does not just break down the process, it supports learning. If every stage has a learning goal, even the brightest students can push themselves further at each stage. • With the structure scaffolding provides, you can make assignments much harder and more interesting, which will challenge and satisfy the best students, while still making it possible for everyone to succeed |

From Fedko and Skene’s “Assignment Scaffolding,” University of Toronto Scarborough

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